STREAMLINING WAREHOUSE PROCESSES WITH VIDEO TECHNOLOGY

The solution to coping with record demand

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How Video Surveillance Can Speed Up Processes and Help Warehouses Deal With Record Demand

The Milestone XProtect® is one of the world's leading video management solutions. XProtect® can combine an existing fixed surveillance system with a body-worn camera system.

Even before the pandemic, consumers had been increasingly moving online. This in turn has pushed the demand for warehouse space – from small delivery sites to huge distribution centers.

A decade ago, ecommerce accounted for 6.7 percent of all retail sales in the UK, according to the Office for National Statistics. By February 2020, the month before the Covid-19 outbreak, the figure was 19 percent. By May, it had hit 33 percent.[1]

The property group CBRE predicts there will be demand for 333m sq ft of new space in the US by 2022 – treble its previous estimate – and expects rents to grow by about six percent a year.[2]

To keep costs down and prompt efficiency further, we see that warehouse owners are turning to advanced video technology for help.

But how can video technology provide the needed solutions?

In this paper, we will share inspiration and ideas on how warehouses can manage the surging demand and optimize operations with advanced video solutions.

Cameras at the epicenter of artificial intelligence

More than 50 percent of the human brain is devoted to processing visual information.[3] This means that the majority of the data needed for artificial intelligence to automate processes and enable humans to make more efficient and better-informed decisions, relies on the ability for computers to translate high quality visual data.

This places cameras at the epicenter of IoT and AI solutions.

The days are over when video merely acted as a surveillance system to secure the facility and deliver compliance. Thanks to the significant increase in compute power, cameras can extract much more information from a single image with much higher accuracy than was possible just a few years ago – especially when coupled with the right analytical tools. This makes it a powerful tool to increase operational efficiency and create value for the business.

The information extracted from video is stored as metadata and indexed with descriptions of what the cameras are seeing. That enables us to classify or recognize objects, determine color, determine object characteristics and do accurate detection. The information can be stored and analyzed to increase overall operational efficiency by e.g. generating automated responses to certain events.

Below are some of the use cases available in our ecosystem:
• Parcel tracking
• Managing access
• Managing storage space
• Optimizing facility space
• Digital signage integration

[1] https://www.ft.com/content/919fc491-b6e4-4ab4-a523-8f19a9c59bb9
[2] https://www.cbre.us/research-and-reports/US-MarketFlash-Retail-to-Industrial-Property-Conversions-Accelerate
[3] https://www.rochester.edu/pr/Review/V74N4/0402_brainscience.html

Increasing operational efficiency

Parcel tracking

An obvious solution for increasing efficiency and customer service levels is to integrate your parcel scanning system with a video management platform. This enables operators to easily monitor and manage incidents with parcels entering, leaving or moving around a facility.

It takes only seconds to track and find a parcel based on its parcel ID or physical characteristics. The visual confirmation of the parcel's location and physical condition is recorded and stored. This means that operations managers can document the physical conditions and whereabouts of the parcel to any internal or external stakeholder. This can also help reduce the number of claims that goods were damaged at the warehouse, as they can prove the parcel was undamaged when it left the facility.

Benefits:
• Reduced tracking and search time
• Visual confirmation
• Lower damage claims

Managing storage space

With the latest video technology and artificial intelligence (AI), cameras can be upgraded into smart IoT devices. These are able to provide valuable information and statistics. One example would be with cross docks, which are temporary storage locations to facilitate fast inbound and outbound handling – here, free or occupied storage space can be instantly detected while other valuable statistics are gathered such as: How long are spaces being used, which area is used the most, and where could efficiency gains be made?

Benefits:
• Improved storage space overview
• Analytical insights for optimized planning and operations
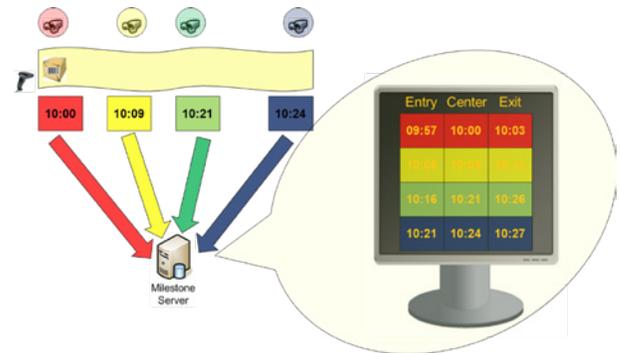
Figure 1 - Concept of XProtect Parcel Tracking. The video management software registers the parcel ID and records video from the actual scan time (center) and a pre and post scan time (entry and exit) of the parcel at several camara/scanning locations inside the facility.
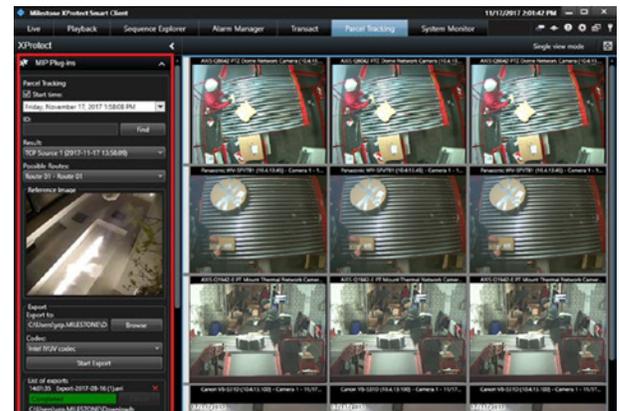
Figure 2 - XProtect Smart Client parcel tracking user interface in action. Left pane shows search options for scanned parcels.

Figure 3 - Storage space recognition. Green bounding boxes indicate available storage spaces.

Optimizing facility layout

Video analytics allow operations managers to monitor the effectiveness of the facility layout. While heatmaps and travelled pathway visualizations provide insights for data driven improvements, real-time detection systems also alert operators when one-way paths are being violated. Such timely intervention can prevent bottlenecks, so operations continue to run smoothly.

Other options for analyzing traffic inside the facility are people counting and/or vehicle counting. In figure 4 you see an example of how video analytics can detect and map pathway activity.

Benefits:
• Prevention of bottlenecks in operation
• Full transparency about strengths and weaknesses in the facility layout
• Data driven improvements of facility layout to increase efficiency

Access management

Managing access for employees and visitors to a facility can be done in several ways: physical access control systems, intercom systems, facial recognition systems, license plate recognition systems (LPR), and digital signage systems just to name a few. Most often these technologies are used as standalone or as a combination of one or two solutions.

Parking management systems can also help operators manage employee and visitor parking. The same parking system technology can be used to manage the loading docks and truck parking.

Here is an example of a fully integrated system powered by video technology:

A truck driver approaches a warehouse facility. The facility has an LPR system installed, and when the license plate has been recognized and the truck granted access, a barrier opens. This means that the driver does not have to stop and ask for access through an intercom: instead, information displays tell the driver which dock he needs to go to for parking and unloading. The signal system has already informed the facility crew about the truck arrival. A live stream overlooking the dock lets them see when the truck is fully parked, partly for the sake of safety before they open the overhead doors.
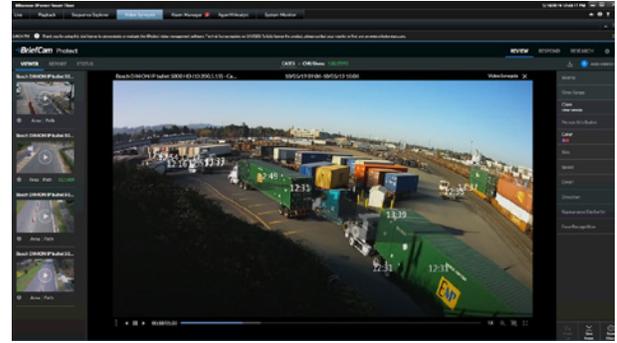
Figure 4 - Monitoring freight. How many trucks came in between 11:00 and 14:00? Which path did they take? This is how your yard can be optimized for efficient traffic flow.

Figure 5 - License plate recognition makes entering and exiting more efficient and keeps a log for registration purpose. Tip: When combined with face recognition this provides double secure verification options and efficient visitor access.
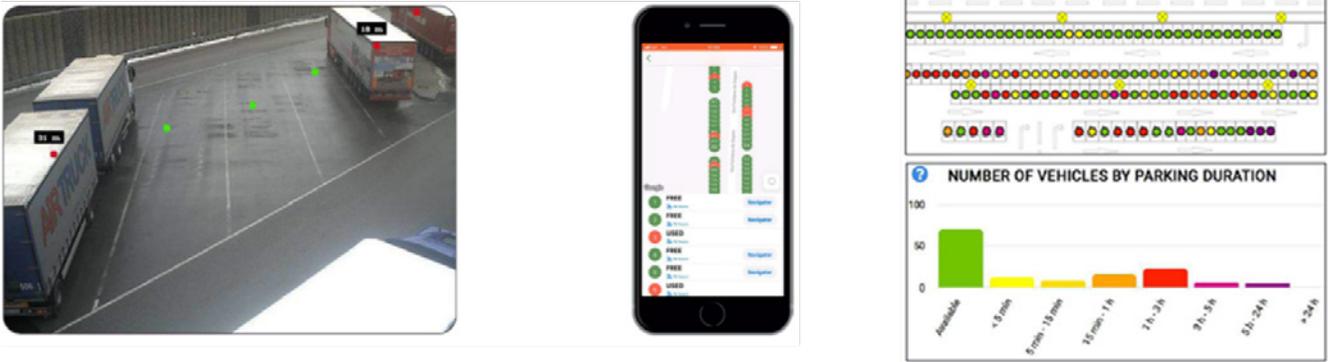
Figure 6 - Parking management and truck docking solution. Operators or digital signage systems guide drivers to the appropriate parking or loading dock. Meanwhile, valuable statistics are collected such as parking time and duration, occupancy and usage frequency.

The truck driver can now use a visitor badge or facial recognition to access the canteen and take a break while the crew is unloading and loading the truck. A display in the canteen keeps the driver updated on the process.

Cameras monitor the dock and parking occupation. This gives operations managers precise stats on the average loading and unloading times.

Benefits:
• Security
- Operations optimization
• Employee productivity
• Personal comfort and wellness

Information and response are key
Information feedback is key for efficiency. A system that keeps employees, visitors and suppliers informed in real-time ensures your operation will run more smoothly.

There are two ways to inform individuals: first by audible, then by visual means.

Audio notifications
Audio notifications are useful for remote assistance and messaging. With a mobile application, operators can address people inside a facility from anywhere at any time. This aids flexibility and efficiency.

Digital signage
Digital signage gives direction to people both inside and outside a facility. Signage systems can display any information activated from the video platform. For example, it could display process information or warehouse KPIs; or, in cases where it recognizes a license plate or face, the display could show a live stream and instructions for that person to follow. In cases of emergency, digital signage can communicate exit routes and other safety information.

In figure 8, the system displays social distancing information relevant for the COVID-19 pandemic.

Figure 7 - Audio integrations improves safety awareness on work floor plus efficient guidance/instructions.

Figure 8 - Digital signage integration enhances operational efficiency

Container ID
Cameras can read container IDs and additional information directly on the containers. In addition, metadata such as ID, container owner, size information, country of origin or hazardous good status can be stored on the video platform and indexed with the recorded video for easy search and notification. These algorithms can run on both cloud and on-premises servers – as well as with IoT devices.

Cloud, on-prem, hybrid – your choice
By 2022, Gartner Consulting predicts that the market size and growth of the cloud services industry will be three times greater than that of overall IT services. Some software vendors are already shifting to cloud-only business models.

So, it is fair to say that companies not investing in the cloud could be writing themselves out of some very exciting opportunities.

This is why cloud computing is a top priority for many business leaders – and certainly for us at Milestone Systems. Our XProtect® management platform is now available on the cloud-based Amazon Web Services (AWS) solution in the AWS Marketplace.

It's expected that cloud and on-premise solutions will, for the time being, overlap in various forms of converged and hybrid set-ups. This will protect investments already made in on-premise video management technology and allow for optimum functionality and load distribution – while enabling the integration of cloud capability elements.

Cloud, hybrid or on-premise. The choice is yours.
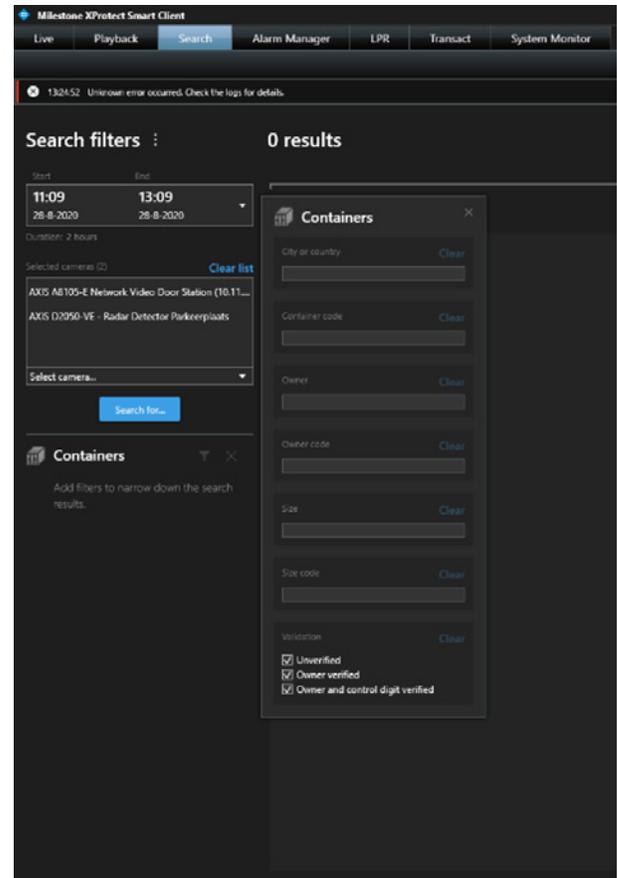
Figure 9 - Search for containers based on ID, size, country, owner/company

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About Milestone Systems

Milestone Systems is a leading provider of open platform video management software; technology that helps the world see how to ensure safety, protect assets and increase business efficiency. Milestone enables an open platform community that drives collaboration and innovation in the development and use of network video technology, with reliable and scalable solutions that are proven in more than 500,000 installations worldwide. Founded in 1998, Milestone is a stand-alone company in the Canon Group.

**For more information visit:
www.milestonesys.com**